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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/087,136	05/28/1998	H. ROBERT HORVITZ	01997/202002	9188

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EXAMINER
CANELLA, KAREN A

ART UNIT	PAPER NUMBER
1642	

DATE MAILED: 10/22/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
09/087,136	Horovitz et al
Examiner	**Art Unit**
Karen Canella	1642

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3 months* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____ .

2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1, 4-7, 10-18, 25, and 34-64* is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1, 4-7, 10-18, 25, and 34-64* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 15, 2002 has been entered.

2. Claims 34-64 have been entered. Claims 1, 4-7, 10-18, 25 and 34-64 are under consideration.

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.

Claim Rejections Maintained

4. The rejection of claims 1, 4-7, 10-18 and 25 under 35 U.S.C. 101 for lacking a specific, substantial asserted utility is maintained for reasons of record. The rejection of new claims 34-64 is also made for the same reasons of record.

The claims are drawn to the nucleic acid encoding the lin-37 protein comprising the amino acid sequence of SEQ ID NO:1 and the nucleic acid sequence of SEQ ID NO:2 or nucleic acids having 50% or greater nucleic acid sequence identity to SEQ ID NO:2 or vectors and host cells comprising the nucleic acid encoding the amino acid sequence of SEQ ID NO:1. However, neither the specification nor any art of record teaches a function for the isolated nucleic acids of SEQ ID NO:2, or nucleic acids having 50% homology to SEQ ID NO:2 beyond the encoding of a SynMuv polypeptide. The specification does not teach a specific and substantial utility for the SynMuv polypeptides, does not teach a relationship to any specific diseases or establish a molecular mechanism or empirical association linking the SynMuv polypeptides to the etiology of any specific diseases. The asserted utilities for lin-37 are only speculative. The specification states on pg 19, lines 3-6, "Experiments which stem directly from this research include searches for

mammalian homologues of the novel SynMuv genes. Such homologues may function in activating, enhancing or otherwise identifying the effect of tumor suppressors." This statement plainly discloses that the sequence of the lin-37 gene and gene product is only the beginning in the search for mammalian homologues and uses of the encoded protein. There is no evidence of record that there is any demonstrated real world use for the lin-37 protein obtained from C. Elegans. Therefore the asserted utilities are speculative, inviting the artisan to elaborate a functional use for the disclosed nucleic acids and the as of yet undisclosed nucleic acids of the putative mammalian homologues as well as a functional use for the mammalian counterparts.

5. The rejection of claims 1, 4-7, 10-18 and 25 under 35 U.S.C. 112, first paragraph is maintained for reasons of record. The rejection of new claims 36-64 is also made for the same reasons of record. Specifically, since the claimed invention is not supported by a well established utility for the reasons set forth in the rejection under 35 USC 101 above, one skilled in the art clearly would not know how to use the claimed invention.

6. Applicant has provided the Declaration of Dr. H. Robert Horvitz in order to obviate the rejection under 35 101. In the Declaration Dr. Horvitz stats that lin-37 is useful as an agent for the modulation of proliferation because lin-37 belongs to a conserved tumor suppressor pathway and that C elegans Class B synMuv genes function as negative regulators of the evolutionary conserved Ras-signal pathway. . Dr. Horvitz argues that many C elegans synMuv genes have homology to mammalian genes known to be involved in cancer: lin-35 encodes a close homolog of the mammalian tumor suppressor protein Rb; lin-53 is a homolog of the Rb-binding protein p48, lin-55 and E2F-1 are homologs of the mammalian DP and E2F proteins. Applicant argues that the instant lin-37 is a C elegans gene for which no mammalian homolog has yet been identified, but that a mammalian homolog will likely antagonize Ras signaling and function in a mammalian tumor. Dr. Horvitz has put forth references by Saito et al (exhibit A), Chang et al

(exhbit B) and Lu et al (exhibit C) in order to substantiate the position that C elegans genes have utility. These references and arguments have been considered but not found persuasive as it appears that the utility of the C elegans genes lies in their use as experimental reagents to isolate human or mammalian genes which might then be determined to that have a specific, substantial and credible utility. Such a use has been determined by the courts to be a utility which, alone, does not support patentability. Since the instant specification does not disclose a credible "real world" use for lin-37, then the claimed invention as disclosed does not meet the requirements of 35 U.S.C. §101 as being useful.

New Grounds of Rejection

7. Claims 1, 4-6, 10-18, 25 and 36-64 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims are drawn to nucleic acid and transgenic cells comprising a nucleic acid having at least 50% nucleotide identity to SEQ ID NO:2, and nucleic acids and cells having a polynucleotide that has a 50%, 85% or 95% or greater amino acid sequence identity to SEQ ID NO:1. Claim 6 is drawn to the nucleic acid of claim 1, wherein the nucleic acid is human. As stated in the response of July 15, 2002, no mammalian homolog for lin-37 ha yet been identified. One of skill in the art would doubt that applicant had a human cDNA encoding a mammalian homolog of lin-37 at the time the invention was filed.

The specification sets forth a written description of the lin-37 gene as SEQ ID NO:2 and the protein encoded thereby as SEQ ID NO:1. The specification does not set forth a written description of lin-37 variants having at least 50%, 85% identity or 95% identity to SEQ ID NO:1 or nucleic acids having 50%, 85% or 95% identity to SEQ ID NO:2. When given the broadest reasonable interpretation the claims read on a large genus of nucleic acids having no functional commonality with SEQ ID NO:2. With the exception of claim 61, the claims do not limit the

genus of variant nucleic acids by function, however, claim 61 lacks adequate written description for the genus of candidate lin-37 nucleic acids. The specification provides doe not provide common attributes of SEQ ID NO:2 that would be representative of the claimed genus of nucleic acids, not does the specification set forth a representative number of species for the claimed genus.

The disclosure of a single species may provide an adequate written description of a genus when the species disclosed is representative of the genus. The instant claims encompass allelic sequences, splice variants, and homologs which are not fully described. There is substantial variability among the species nucleic acids encompassed within the scope of the claims because they are not limited by a common structural feature or a defined function. Thus SEQ ID NO:2 or the polynucleotide encoding SEQ ID NO:1 are not descriptive of variant nucleic acids having 50%, 85% or 95 % identity to SEQ ID NO:2. Thus claims 1, 4-6, 10-18, 25, 36-60 and 62-64 encompasses a genus with widely varying attributes.

A description of a genus of nucleic acids may be achieved by means of recitation of a representative number of nucleic acids, defined by nucleic acid sequences, falling within the scope of the genus or a recitation or structural features common to members of the genus, which features constitute a substantial portion of the genus. (Reagents of the University of California v. Eli Lilly, 119 F3d 1559, 1569, 43 USPQ2d 1398-1406, Fed. Cir. 1997).

The written description sets forth only SEQ ID NO:2 and one of skill in the art could determine the polynucleotides encoding SEQ ID NO:1. Therefore there is no disclosure of a single common structural feature shared by members of the claimed genus. Since the claimed genus encompasses genes yet to be discovered (mammalian homologues and homologs from diverse species) the polynucleotide encoding SEQ ID NO:1 do not "constitute a substantial portion" of the claimed genus.

Claim 61 is drawn to a lin-37 nucleic acid having about 50% or greater sequence identity to SEQ ID NO:2 isolated by expressing a candidate lin-37 nucleic acid within a cell, wherein a

decreased level of cellular proliferation identifies a lin-37 nucleic acid. The method is dependent upon a genus of nucleic acids which would constitute a candidate lin-37 nucleic acid. The written description does not set forth any structural or functional features which would identify a candidate lin-37 nucleic acid. Thus, for the reasons set forth above, the specification fails to provide an adequate written description of the variant lin-37 nucleic acid as isolated by the claimed method.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karen Canella whose telephone number is (703) 308-8362. The examiner can normally be reached on Monday through Friday from 8:30 am to 6:00 pm. A message may be left on the examiner's voice mail service. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Caputa, can be reached on (703) 308-3995. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196.

Karen A. Canella, Ph.D.
Patent Examiner, Group 1642
October 21, 2002

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